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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,524	10/24/2003	Steve Johnson	MWS-039RCE	9823
74321 7590 09/26/2008 LAHIVE & COCKFIELD, LLP/THE MATHWORKS FLOOR 30, SUITE 3000 One Post Office Square Boston, MA 02109-2127			EXAMINER KANG, INSUN	
			ART UNIT 2193	PAPER NUMBER
			MAIL DATE 09/26/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/692,524	JOHNSON, STEVE	
	<b>Examiner</b>	<b>Art Unit</b>	
	INSUN KANG	2193	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-16,18-30 and 37-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5-16, 18-30, and 37-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |



### **DETAILED ACTION**

1. This action is in response to the RCE amendment filed on 7/16/2008.
2. Claims 1, 3, 5-16, 18-30, and 37-40 are pending in the application.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 5-16, 18-30, and 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conway ("Parsing with C++ Deferred Expressions," ACM SIGPLAN Notices, vol. 29, no. 9, pp. 9-16, ACM, 1994) in view of Walter et al. ("boost C++ Libraries uBLAS Overview," copyright 200-2002) hereafter Walter.

Per claim 1:

Conway discloses:

- providing via a programming language, a language processor with built-in support for a parse tree data structure written in a base language (i.e. page 9, section 2 The deferred expression idiom, second paragraph) said parse tree represented as a class, said class being the basis for a plurality of parse tree objects, said parse tree objects including methods able to retrieve values for base language objects (i.e. page 12, section 5 Embedding Deferred Assignments, third paragraph)
- defining an assignment function, said assignment function taking a plurality of parse

- tree structures as arguments (i.e. see page 12, Fig. 4 presenting the deferred assignment operator under section 5. Embedding deferred assignments).
- - defining said assignment function in more than one class (i.e. see page 12, Fig. 4 presenting the deferred assignment operator under section 5. Embedding deferred assignments).

Conway does not explicitly disclose overloading said assignment function based on a context of said base language objects. However, Walter teaches it was known in the pertinent art, at the time applicant's invention was made, to evaluate the left hand side of the overloaded assignment operator. It would have been obvious for one having ordinary skill in the art to modify Conway's disclosed system to incorporate the teachings of Walter. The modification would be obvious because one having ordinary skill in the art would be motivated to make the left-hand side of an assignment available for evaluation based on a context of the objects (i.e. page 4, lines 1-7).

Conway further discloses calling said assignment function to determine the value of at least one assignment within at least one of said base language and a base language extension to said base language (i.e. page 9, section 2 The deferred expression idiom, fourth paragraph).

Per claim 3:

Conway further discloses:

- wherein said assignment function overloads a mathematical operator (i.e. page 13, section 6 Embedding other binary operations, first paragraph).

Per claim 5:

Conway further discloses:

- evaluating said class at compile-time, and (i.e. page 9, section 2. Deferred Expression Idiom, third and fourth paragraphs)
- adjusting the resulting class definitions from said evaluation to increase the efficiency of run-time performance (i.e. page 10, lines 3-6).

Per claim 6:

Conway further discloses:

- overloading a mathematical operator with said assignment function to alter the sequence of evaluation of operands usually followed in said programming language, said overloading designating the order of operand evaluation (i.e. page 12, section 5 Embedding Deferred Assignments, last paragraph).

Per claim 7:

Conway further discloses:

- calling a method in said parse tree object to determine a type of operator at a root of a said parse tree data structure (i.e. page 10, lines 3-6; page 11, second paragraph).

Per claim 8:

Conway further discloses:

- calling a method in said parse tree object to retrieve one of an associated left and right tree (i.e. page 12, section 5 Embedding Deferred Assignments, third paragraph).

Per claim 9:

Conway further discloses:

- wherein the root of said parse tree data structure is one of a constant, variable, a mathematical symbol and a mathematical expression (i.e. page 12, section 5 Embedding Deferred Assignments, second paragraph).

Per claim 10:

Conway further discloses:

- wherein said assignment function is not explicitly defined (i.e. page 12, fig. 4).

Per claim 11:

Conway further discloses:

- wherein said assignment function is used to identify in-place operations (i.e. page 13, fig. 6).

Per claim 12:

Conway teaches the various assignment functions (unary, binary) (i.e. page 13, Fig. 6).

Conway does not explicitly teach that said assignment function is used to identify and perform multiply and accumulate ("MAC") operations. However, it would have been obvious for one having ordinary skill in the art to modify Conway's disclosed system to include an assignment

function on MAC operations ( $A=B+C*D$ ) besides the disclosed operations. The modification would be obvious because one having ordinary skill in the art would be motivated to perform an assignment operation having an MAC operation if present.

Per claim 13:

Conway further discloses:

- wherein said base language is one of C++, Java, System-C, VHDL, Verilog, C#, IDL, MATLAB and a language based on the .Net framework (i.e. page 9, abstract).

Per claim 14, it is another method version of claim 29, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 29 above.

Per claim 15, it is another method version of claim 30, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 30 above.

Per claims 16, 18-28, they are other method versions of claims 1-13, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-13 above.

Per claims 29 and 30:

Conway teaches using the parse tree classes to generate code (i.e. page 10, section 3. The ParserExpr Base Class, first paragraph). Conway does not explicitly teach the parse tree classes are used for an embedded processor and processor emulation. However, it would have been obvious for one having ordinary skill in the art to modify Conway's disclosed system to use the parse tree classes in various processor environments if desired. The modification would be



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obvious because one having ordinary skill in the art would be motivated to apply the disclosed parse tree structure for an embedded processor and processor emulation, if desired.

Per claims 37 and 38, they are the medium versions of claims 14 and 15, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 14 and 15 above.

Per claim 39, it is another method version of claim 3, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 3 above.

Per claim 40:

Conway discloses:

- building a parse tree data structure based on source code with the language processor; (i.e. page 9, section 2 The deferred expression idiom, second paragraph) instantiating a first parse tree object and a second parse tree object (i.e. page 12, section 5 Embedding Deferred Assignments, third paragraph)
- evaluating said second parse tree object to obtain a value (i.e. see page 12, Fig. 4 presenting the deferred assignment operator under section 5. Embedding deferred assignments).

Conway does not explicitly disclose said evaluating done based on a context provided by said first parse tree objects. However, Walter teaches it was known in the pertinent art, at the time applicant's invention was made, to evaluate the left hand side of the overloaded assignment operator. It would have been obvious for one having ordinary skill in the art to modify Conway's disclosed system to incorporate the teachings of Walter. The modification would be obvious because one having ordinary skill in the art would be motivated to make the left-hand

size of an assignment available for evaluation based on a context of the objects (i.e. page 4, lines 1-7).

Conway further discloses assigning said value to said first parse tree object (i.e. page 9, section 2 The deferred expression idiom, fourth paragraph).

### *Response to Arguments*

5. Applicant's arguments with respect to claims 1, 3, 5-16, 18-30, and 37-40 have been considered but are moot in view of the new ground(s) of rejection.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to INSUN KANG whose telephone number is (571)272-3724. The examiner can normally be reached on M-R 7:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis A. Bullock, Jr. can be reached on 571-272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from

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a USPTO Customer Service Representative or access to the automated information system, call  
800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Insun Kang/

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